RUSC Revista de Universidad y Sociedad del Conocimiento
Universities and Knowledge Society Journal

http://rusc.uoc.edu

ARTICLE

Innovation in Ibero-American Universities

Miguel Casas Armengol
marmengol_6@yahoo.es
Founder-Director of the National Open University of Venezuela (UNA)

Lily Stojanovic
Lilystojanovic@yahoo.com
Tenured Lecturer, National Open University of Venezuela (UNA)

Submitted in: October 2011
Accepted in: March 2012
Published in: January 2013

Recommended citation

CASAS, Miguel; STOJANOVIC, Lily (2013). "Innovation in Ibero-American Universities" [online article]. *Universities and Knowledge Society Journal (RUSC)*. Vol. 10, No 1, pp. 240-253. UOC. [Accessed: dd/mm/yy].
<http://rusc.uoc.edu/ojs/index.php/rusc/article/view/v10n1-casas/v10n1-casas-stojanovic-en>
<http://dx.doi.org/10.7238/rusc.v10i1.1345>
ISSN 1698-580X

Abstract

Innovation in universities is not a new object of study. Indeed, such innovation used to be considered an individual, sporadic and isolated phenomenon. This article presents it as a fundamental process for the transformation of today's universities, which are essential instruments for promoting the major social and scientific changes that will be required to progress effectively towards the future information and knowledge society (Castells, 2001). Research and graduate studies are key elements for underpinning innovation, as are pertinence, virtualisation and integration (Casas, 2005).

The globalisation process is irreversible. It transforms societies, changing them at an unequal yet very dynamic pace. Universities become an indispensable instrument for supporting and replicating change. Education systems must shift towards the knowledge society and generate the meaningful knowledge it needs. Innovation should be understood as a process and not simply as a product. The crucial part of educational innovation will involve not only training teachers to use ICTs, but also

Original title: *Innovación en la universidad iberoamericana*

changing the educational paradigm of their teaching practice, in order to build an organisational model that allows them to adapt to their complex, changing environment.

Keywords
globalisation, knowledge, online distance education, innovation

Innovación en la universidad iberoamericana

Resumen
El estudio de la innovación en la universidad no es algo nuevo; en el pasado fue, principalmente, un fenómeno individual, esporádico y aislado. En este documento, se presenta como fundamental para transformar las universidades actuales, que deben ser los instrumentos esenciales que impulsen los grandes cambios sociales y científicos que permitirán progresar efectivamente hacia la futura sociedad del conocimiento (Castells, 2001). La investigación y el posgrado son elementos claves para apoyar la innovación, así como la pertinencia, la virtualización y la integración (Casas, 2005).

El proceso de globalización es irreversible y provoca que las sociedades se transformen, que cambien con ritmos desiguales pero muy dinámicos. La universidad se convierte en un instrumento imprescindible para sustentar el cambio y reproducirlo. Los sistemas educativos deben movilizarse en relación con la sociedad del conocimiento y generar el saber significativo que se requiere. La innovación debe entenderse como proceso, no solo como producto. La parte crucial de la innovación educativa consistirá no solo en habilitar a los docentes en el uso de las TIC, sino en modificar el paradigma educativo de su práctica docente para construir un modelo organizativo que les permita adaptarse a un entorno cambiante y complejo.

Palabras clave
globalización, conocimiento, educación a distancia virtual e innovación

This article focuses on the phenomenon of innovation as a driver of and fundamental process for the transformation of both face-to-face, and distance and online universities. They are essential instruments for promoting the major social and scientific changes that will be required to progress effectively towards the future information and knowledge society (Castells, 2002) in countries with diverse levels of development.

In universities, innovation is not synonymous with change. Change is just the replacement of one practice by another. Innovation is a change designed to improve, reform and achieve institutional outcomes that are better than the current ones.

University innovation, which used to be considered an individual, sporadic and isolated element, has now become a social and collective phenomenon in which universities need to play a key role; they have to combine their scientific and technological activities with others of an organisational, financial and commercial nature in order to profoundly transform the general and productive structures of every contemporary developed – or developing – society.

This article studies various theoretical aspects of the current forms of innovation and their importance, as well as the obstacles that modern innovation systems have to overcome in order to develop. It also analyses how innovation can impact on new forms of organisational structure, allowing universities to improve their effectiveness in terms of bringing knowledge to large swathes of the population that have historically lacked real educational opportunities.

Universities in a changing, globalised world

Today's world and diverse societies are the result of many continuous yet extremely slow changes over many centuries. The Agricultural Revolution emerged 10,000 years BC, and the Industrial Revolution began in the 18th century AD. In the last four decades, however, the convergence of powerful computers and information and communication technologies (ICTs) has hastened the speed of the current Information Revolution, bringing with it far-reaching changes in all areas of knowledge and of contemporary society. Furthermore, the pace of such changes is so fast that it often overwhelms our ability to understand them and, more importantly, makes it very difficult to anticipate what its multiple effects on the various components of society will be, whether that society is 'developed' or 'developing'.

In addition, a new global force has emerged: 'globalisation', which connects regions and countries, profoundly affects economic, scientific, technological, political, cultural and educational sectors, and demands significant restructuring of ways of life, education and government in different countries. Tünnermann (2007) points out that:

> While globalisation is not confined purely to the economic aspect, since, in reality, it is a pluridimensional process, it is indeed economic globalisation that pulls every other aspect, and it is characterised by its asymmetry: the global economy has not led to the formation of a true global society, where profits and gains are better distributed, but rather to a growing inequality between and within nations.

Today, knowledge is the most effective resource for innovatively solving problems related to the much sought-after world peace, though it can be used for our very destruction too. The need for and importance of education and universities are evident because the future of every society is conditioned by the education system and, above all, by its universities. Hence the assertion that no current society is greater than its universities.

Besides fulfilling the objectives that traditionally correspond to them, contemporary universities are charged with taking account of two new forces: first, the emergence of constant changes in knowledge societies, and second, globalisation. Both are global phenomena, and that is why a rapid restructuring of their current model is demanded. In this respect, Díez (2002) asserts that:

> Nowadays, the world is in the throes of a 'major transition', with rapid changes and a process of globalisation, the true extent of which is practically unknown. Globalisation is not an ideology, or a

> negative or positive phenomenon. Rather, it is almost certainly an irreversible process that ought to be placed at the service of all, starting with justice and social cohesion, and not just a privileged few, with the consequent generalised and odious disparities.

Today, many societies are moving towards what we could call the 'future communication and information society', which represents the first step towards the future knowledge society. Universities capable of responding to the new demands of globalisation are therefore needed. This does not mean that a single, common, standard curriculum should be promoted for higher education as a whole. In reality, the problem of the global versus the local begs a solution of 'articulation' rather than 'exclusion'. Indeed, there should be a response to the one-off priority or basic needs of an immediate environment, without forgetting that it should also be compatible with problem-solving on a global scale. Thinking, researching and disseminating know-how on a global scale is the best and most effective way to act locally; similarly, thinking, researching and disseminating on a local scale is the most effective way to contribute to global action.

Universities and innovation

Today's world and societies are undergoing constant, profound changes, usually unexpected and often traumatic. The typical university of the past is not ready to rise to these new challenges and, therefore, is not able to respond appropriately to the many new problems that complex contemporary societies pose. In this respect, Díez (2002) points out that:

> While universities have always played a considerable role in cultural, social and economic development beyond their environments, their importance nowadays is incomparably greater than ever before, given the dizzying and profound change that globalisation brings with it, which is loaded with both opportunities and challenges. Under these circumstances, future material progress is more and more dependent on innovation at the service of productivity, competitiveness and progress, and also at the service of individual and collective access to the most advanced knowledge, thanks to basic and applied research. However, to ensure that both social and human development is sustainable, innovation must be governed by ethical and moral values, and academia must act accordingly.

The amount of information and knowledge is growing faster, thanks to state-of-the-art research and the power of new technologies. It all forms part of what is called the 'transition process', which now forces us to have a global, interdisciplinary and long-term vision. In teaching and learning processes, a host of technological innovations are constantly emerging: new systems and modalities of online distance education, multimedia offerings, teleconferencing, CDs, a wide range of software, e-mail and new forms of e-learning.

Initially, many of these tools were developed separately. But, now more than ever, what we are witnessing is their interaction; this multiplies their didactic power, as demonstrated by the contributions made at numerous international conferences on this novel topic. Despite such

extraordinary technological advances, however, we cannot expect the Internet and computers to be the panacea, since – in certain situations and for certain functions of face-to-face universities – lectures and the written word (books, magazines, notes, etc.) still play a valuable role, especially if they are integrated into multimedia offerings through original educational strategies. This highlights the nonsensicality of the supposed clash between texts and technology. In this respect, it should be noted that a fully online university like the Open University of Catalonia (UOC) uses books, texts, guides and notes in most of its courses, which are efficiently articulated using state-of-the-art educational technology.

Despite major technological advances in education, however, two components continue to be essential in modern teaching-learning processes: a) good lecturers and b) creative instructional strategies. Without them, the most advanced technological innovations will not suffice. Lecturers need to break free from their limited, obsolete roles, in which they have claimed to be the only holders of information, and must now focus on guiding, observing, criticising, analysing and creatively solving specific problems of very different natures.

Regarding instructional strategies, the objectives to be attained, the learning theories that underpin them, and the best procedures and means for doing so need to be taken into account before selecting any particular technologies. It is worth recalling that the objective is not the channel, tool or medium, but the function. In other words, it is not appropriate to start with preconceived ideas about which particular course will be implemented exclusively using television, radio, computers or teleconferencing.

On the other hand, the need to train a new type of academic (lecturer, investigator and director) cannot be postponed. Such an academic should be able to understand and drive the necessary changes for these universities of the future. Without this change in training and behaviour, the typical, traditional university academic will stand in the way of reiterated attempts to achieve institutional transformation and modernisation, which has often been – and still is – the case. In this respect, Casas (2000) points out that:

> The biggest barrier to the acceptance of educational innovations and the use of new technologies in universities is not the lack of resources or will of their directors in terms of accepting the need for change or other ideological or philosophical objections; in reality, the biggest obstacle is the fear that many lecturers have, who do not feel comfortable with the technological innovations or, perhaps more importantly, who do not know how to use them effectively. The problem does not come down to a lack of training in a specific technology, but rather to a lack of an appropriate structure for guiding them in the use of technology. In other words, in both the cultural and institutional contexts, a technology culture or new paradigm is not properly consolidated. Consequently, many people in positions of responsibility within the field of teaching have not received any appropriate instructional training on which to base their future teaching practice or research.

Theoretical approaches to innovation

If we turn our attention to the prior considerations of this study, relative to the key importance of education and especially of universities in guiding social, scientific and technological changes, it is easy to understand just how crucial the innovation process is in terms of restructuring modern universities and adapting them to the needs of intensely dynamic contemporary universities. However, it should be very much taken into account that universities, even in our times, are usually quite conservative institutions, especially in societies like Latin-American ones. This alerts us to the enormous difficulties that need to be addressed. Consequently, and especially in cases like these, the challenge is both imposing and inevitable, and that is why the creative use of innovation is a key instrument.

There are two different innovation circumstances and situations corresponding to two different periods of time, and a good understanding of them can be grasped from the studies conducted by Albornoz (2002):

> In the first sense, the term 'innovation' refers to the ability to accept and incorporate new elements, with regard to both cognitive content and procedures. In a rapidly changing world like today's, that ability would seem good in its own right, in keeping with the dynamics of the time, and reason enough to demand a fitting response from university institutions. This meaning of the term 'innovation' represents the opposite idea of obsolescence or resistance to change, both of which are traits that, to a great extent, have characterised university institutions. In this first sense, the universities' attitudes to innovation are not quite so straightforward. Such long-standing institutions necessarily feel the tension between the search for and acceptance of all things new, and the preservation and safeguarding of the most enduring pieces of basic knowledge.

Regarding the second conception of innovation, the above-mentioned author also points out that:

> In the second, more specific sense, however, the concept of innovation is laden with theoretical notions, such that it explains economic growth phenomena on the basis of competition and the incorporation of new technologies into the productive process. This process does not have just a single direction of progress. Instead, it involves social tensions that are necessarily part of the reason why competitive processes lead to the proclamation of winners and losers. Many people are noticing that the dynamics of innovation are helping to make the divide between rich and poor even wider.

The conception and scope of the concept of university innovation can be more clearly ascertained by taking a look at what two Latin-American authors have to say on the topic:

> Innovation means a change in the relationships and processes between the elements of a system. In the context of Latin America and the Caribbean, there is a permanent, natural dilemma between the old and the new; the common problems of reach and quality have not been solved, and they are unlikely to be

> if traditional solutions keep on being adopted. This is particularly so now, with the emergence of new challenges and products – among other social phenomena – from the globalisation of the development of science and technology, and of information and communication. This situation demands that new solutions be sought and built. [Moreno, 2008]

> It is something that is considered to be different and novel in comparison to what exists in the environment of a person, group, organisation or society. It can be a material object (a car, an electronic device, a book, etc.) or an immaterial object (an idea, a service, a technique, an organisation, etc.). [Silvio, 2006]

Albornoz (2002) asserts that innovation is the cornerstone of the knowledge society and one of the drivers of globalisation, though, for social and human development to be sustainable, innovation must be governed by ethical and moral values.

Distance education has long been practised through traditional means, using paper-based, analogue media. But today, it has become an important innovation, basically because it has been virtualised. In general, virtualisation is a process of communication using computers capable of storing data, information and knowledge. Through Internet-mediated operations, it can include the representation of processes and objects relative to teaching and learning activities (Silvio, 2000). However, the precise nature of the concepts can be better illustrated by three-dimensionality, in which place, time and virtuality are related. This is shown in Figure 1, which defines the different educational modalities.

> Firstly, we find non-virtual face-to-face education, in which all the actors are present in the same place at the same time; these are the characteristics of what we know as 'traditional education', in which there is no virtuality. Secondly, non-virtual distance education is exemplified by traditional distance education, in which the teacher and the learner are located in different places at different times, and

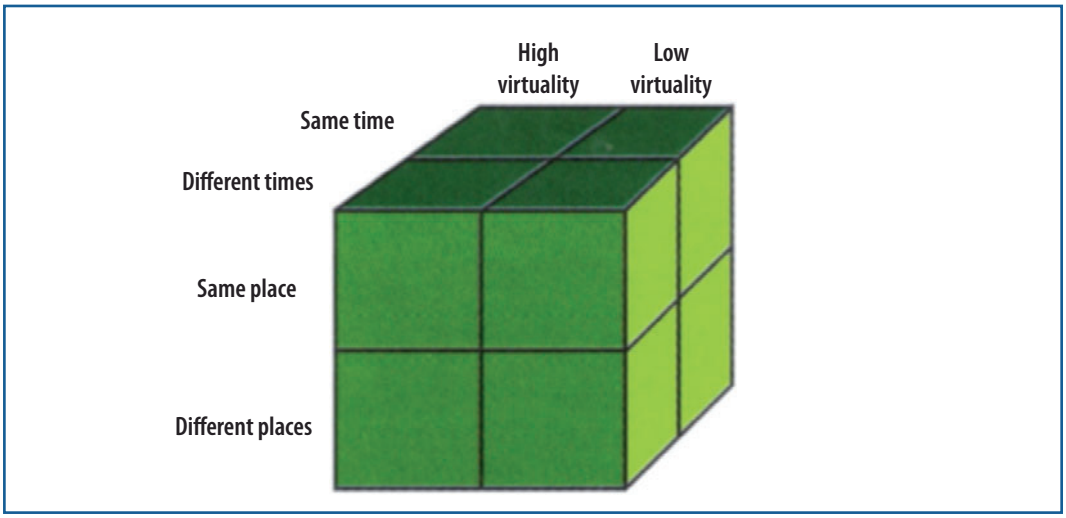

Figure 1. Silvio (2006).

use very varied non-digital, non-computerised and heterogeneous media, in an environment without any virtuality or digital resources. Thirdly, virtual face-to-face education, which is based on educational acts, performed using computers. All the actors are present in the same place at the same time, e.g., in a computer room, where all the actors are connected by a local network. In this case, there is a high level of virtuality, a high level of physical presence, and the possibility for actors to relate to each other face-to-face. Finally, online distance education, in which all the actors interact through digital representations of all the elements of the teaching-learning process in different places at different times. Employing asynchronous communication, this is the most recent educational modality with the highest level of virtuality. It is generally associated with e-learning.

Some of the most important studies on innovation and its diffusion in institutions have been conducted by Rogers (2003) from Stanford University. In this respect, the basic points of his theory are:

1. To determine the characteristics of people likely to favour the adoption of an innovation.
2. To study the social characteristics of people, groups, organisations, communities and societies capable of exerting influence over innovation diffusion processes.
3. To determine the stages of behaviour through which a person adopting an innovation goes.
4. To study the characteristics of an innovation in order to make it attractive.
5. To analyse the roles played by actors involved in the process of diffusing an innovative element, especially those of opinion leaders.

In the face of innovation, people react in very different ways and adopt different stances towards it. Rogers (2003) classifies them into five groups:

A. Innovators: who assume the risks of introducing and diffusing an innovation. They are generally the producers of the innovation.
B. Early adopters: who adopt an innovation for the first time without much discussion or analysis; they can act as recognised and respected leaders.
C. Early majority: these are actors who are not prepared to run any kind of risk or waste time and resources; they exhibit some resistance to change; they analyse it and think about it carefully before taking a decision.
D. Late majority: these are actors who are very resistant to change; they do not adapt to an innovation without an intense persuasive attitude and significant influence.
E. Laggards: who are the most resistant to change. They exhibit indifference to any innovation, and even oppose it and actively fight it.

According to the studies conducted by Rogers and cited by Silvio (2006), these categories are distributed along a normal curve, as shown in Figure 2. First is a very small minority of innovators (2.5%). Second is a group of early adopters (13.5%). Third is an early majority (34%). Fourth is a late majority (34%). And finally, fifth is a small group of laggards (16%). Besides these characteristics,

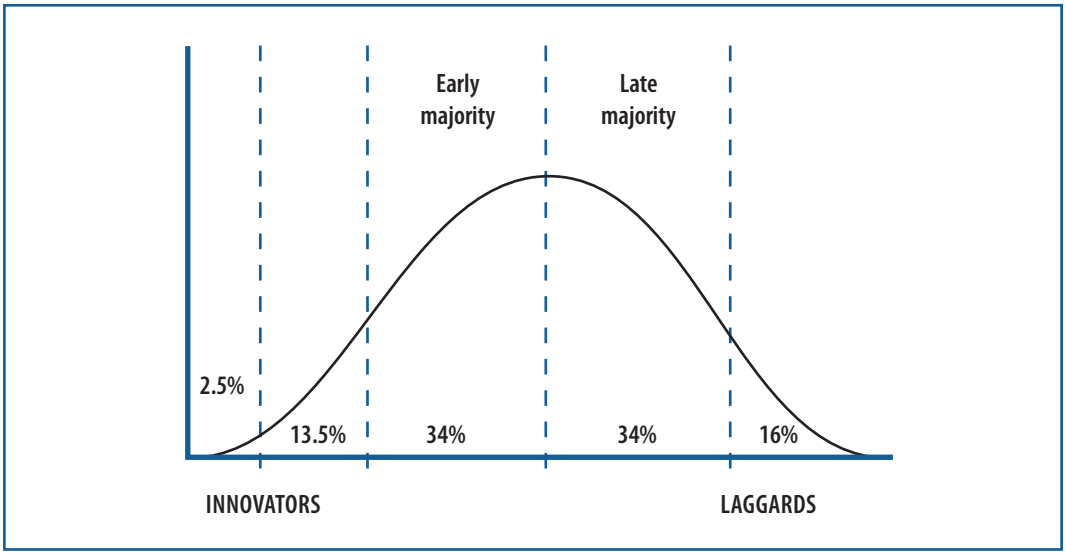

Figure 2. Category of innovation adopters, and percentage of the total population of adopters.
Source: Rogers (2006).

the aspects listed below need to be taken into account before introducing an innovation into any institutional or organisational area of a social system:

- The characteristics of the target population, that is to say, the recipient population and potential users.
- The characteristics that make an innovation likely to be adopted by the population.
- The consequences that an innovation will have to assume on behalf of people, groups, organisations and societies.
- The communication channels used to diffuse an innovation.
- The estimated adoption stages.

Various associations and some university directors have reached the conclusion that most of today's universities urgently need to undergo major transformation to adapt to the new and changing circumstances of their societies.

Current importance of implementing innovation in many Ibero-American universities

The quality standards of Ibero-American universities are very varied, but all of them will need to implement innovation plans, individually and in the short term. Indeed, some Spanish universities that have recently decided to incorporate the provisions of the 1998 Sorbonne Joint Declaration and the 1999 Bologna Declaration to reform their curricula and degrees will also need further innovation plans to take account of their situation in a changing, globalised world.

In a UOC inaugural lecture, Professor Carnoy (2004) from Stanford University concluded that the use of ICTs and computers in many universities was, at that time, much lower than in large industries and international firms. The latter used them to make continuous improvements to their products, their employees' skills and their competitiveness. This is another good reason to include the use of ICTs and computers in the respective universities' innovation plans.

Latin-American Universities and their socioeconomic and political contexts are critically analysed in the prospective study of the future of distance education and of e-learning (ILCE, 2008). Hence the extraordinary importance of educational innovation for universities in this sub-region:

> The globalisation process is historically irreversible. It transforms societies, changing them at an uneven yet very dynamic pace. In this new society, education becomes an indispensable instrument for supporting and replicating change. Education systems must shift towards the knowledge society and generate the meaningful knowledge it needs. Innovation is its instrument, and it should be understood as a process and not simply as a product.

Finally, we need to highlight the fact that the innovation process is ongoing. As such, Universities must ensure that it is maintained over time in order to respond to the new demands of the social, economic, technological and scientific context. In this respect, the UOC's educational model is exemplary. While it was initially based on a virtual educational model (1994-1998), in 1998 it approved a new educational model, also virtual, that incorporated experiences gained from the previous one.

Obstacles to innovation

In a world of abrupt changes, many of which are unforeseen, the biggest obstacles arise from cultural trends and values that tend towards indolence, routine and perpetuation. Many universities recognise the need to innovate, but there is no decisive leadership to tackle the actions of change that innovation requires. In reality, any innovation project involves taking major risks in a context of uncertainty, when faced with the unknown. While doing more of the same used to be the safest route for universities to take, any resistance to change is now a guarantee of failure.

In general terms, resistance to change is more noticeable in conservative universities, which try to solve the problem through a dichotomous discourse. On the one hand, they recognise the importance and expedience of making major reforms, but, on the other, they continue to actively or passively – and very effectively – resist, thus hindering any real attempt to renew and progress. Consequently, any innovation plan must include an important and sustained campaign to convince the members of the institution, university or firm that their support is crucial because, without it, the best theoretical plan is destined to fail.

As a result of implementing a significant innovation, jobs in firms become redundant. Schumpeter (1934) called this 'creative destruction'. Some authors tend to underestimate the importance of such job losses, arguing that posts will be occupied by new employees with different competencies and

skills. However, that process of change will also affect many academics who lack the conceptual and instructional preparation in the use of new ICTs. Consequently, they are not very convinced by the changes that they will have to face in a radical innovation project.

Future of Ibero-American universities

The transformation of these universities cannot be solved by improving just some of their principal elements (structure, curriculum, administration, etc.), since innovation has to be applied integrally and globally to a university as a whole in order to achieve really important, meaningful results. Rather than talk about a transformation of higher education, some people prefer to talk about a revolution in the way universities think, which is characterised by complexity and, essentially, interdisciplinarity. These challenges lead to academic responses that together form the nucleus of today's university transformation processes, which should partially inspire educational and academic models (Tünnermann, 2007):

- The adoption of learning-to-learn paradigms and lifelong learning.
- Shifting the focus of teaching-learning to learning processes.
- The new role of lecturers, in light of the students' protagonism in the construction of meaningful knowledge and its comprehension.
- Curricular flexibility, and all modern curriculum-related theory that is being applied to curriculum redesign.
- The promotion of greater flexibility in academic structures.
- Credit systems.
- The close relationship between universities' basic functions (teaching, research, extension and services).
- The redefinition of generic and specific competencies.
- Institutional re-engineering and strategic management as a normal component of university administration.
- Responsible university autonomy.
- Processes linking universities to society and various sectors of that society (productive, labour, business, etc.).

Finally, Figure 3 (Casas, 2005) is a mind map showing how innovation can be related in a modern university in order to emphasise its influence on the knowledge society.

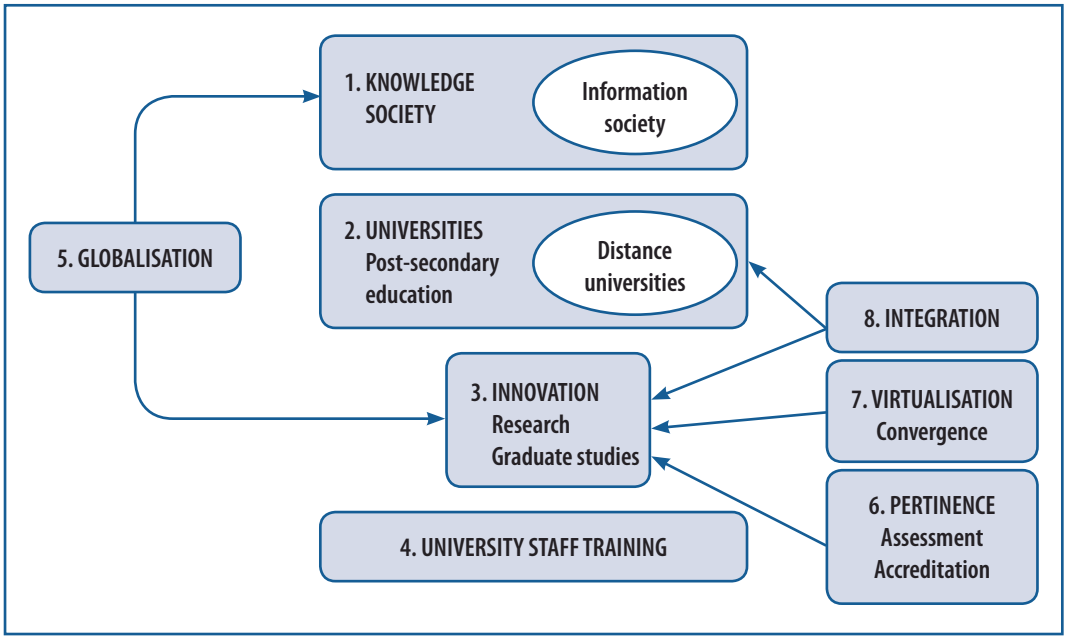

Figure 3. Mind map of new universities.
Source: Casas (2006).

References

ALBORNOZ, M. (2002). "La universidad ante la innovación" [paper]. In: ***Aprender para el futuro.*** Madrid: Fundación Santillana.

ALTAREJOS, F.; RODRÍGUEZ, A.; FONTRODONA, J. (2003). *Retos educativos de la globalización. Hacia una sociedad solidaria*. Pamplona: EUNSA.

BRICALL, J. (2000). "Introducción. Un periodo de transición de la universidad". In: *Universidad* 2000. Madrid: Grupo Industrial de Artes Gráficas.

BRUNNER, J. J. (2003). *Educación e internet. ¿La próxima revolución? Breviario.* Santiago de Chile: Fondo de Cultura Económica.

BUARQUE, C. (2005). "La universidad en una encrucijada". In: *Seminario Internacional*. Buenos Aires.

CARNOY, M. (2004). "ICT in Education: Possibilities and Challenges". In: *Lección inaugural del curso académico*. Barcelona: UOC.

CASAS ARMENGOL, M.; STOJANOVIC, L. (1999). "Distance Education: A Decisive Force for Restructuring the Latin American University" [CD-ROM]. In: *Conferencia Mundial del ICDE*. Vienna.

CASAS ARMENGOL, M. (2005). "Nueva universidad ante la sociedad del conocimiento" [online article]. *Universities and Knowledge Society Journal (RUSC)*. Vol. 2, No 2.

CASAS ARMENGOL, M.; STOJANOVIC, L. (2005). "Innovación y virtualización progresivas de las universidades iberoamericanas hacia la sociedad del conocimiento". In: RIED. Madrid.

CASTELLS, M. (2002). *La Era de la Información. Vol. I: La Sociedad Red*. Mexico, Distrito Federal: Siglo XXI Editores.

CASTELLS, M.; HIMANEN. P. (2002). *El estado del bienestar y la sociedad de la información. El modelo finlandés*. Madrid: Alianza Editorial.

CRESALC; UNESCO (1997). *La educación superior en el sigo XXI. Visión de América Latina y el Caribe*. Caracas. Vols 1 & 2.

DANIEL, J. S. (1996). *Mega-Universities and Knowledge Media: Technology Strategies for Higher Education*. London: Kogan Page.

ESCOTET, M. A. (1991). *Aprender para el futuro*. Madrid: Fundación Ciencia, Democracia y Sociedad.

FUNDACIÓN OVSI (2002). *Informe sobre la sociedad de la información en Iberoamérica*. Alicante: Fundación OVSI.

GALCERAN, M.; DOMÍNGUEZ, M. (1997). *Innovación tecnológica y sociedad de masas*. Madrid: Editorial Síntesis.

GARCÍA SUÁREZ, J. A. (2006). *¿Qué es el espacio europeo de educación superior? El reto de Bolonia*. Barcelona: Universidad de Barcelona.

GROS, B. (coord.) (2009). *El modelo educativo de la UOC. Evolución y perspectivas*. Barcelona: UOC.

HANNAN, A.; SILVER. H. (2005). *La innovación en la enseñanza superior*. Madrid: Narcea Ediciones.

ILCE (2008). *El futuro de la educación y del e-learning en América Latina. Una visión prospectiva*. Mexico: ILCE.

REDDY, V.; MANJULIKA, S. (2002). *Towards Virtualization: Open and Distance Learning*. New Delhi: Kogan Page.

ROGERS, E. (2003). *Diffusion of Innovations*. New York: Free Press.

SCHUMPETER, J. (1984). *Capitalismo, socialismo y democracia*. Madrid: Aguilar.

SILVIO, J. (2006). "El liderazgo en la gestión de la calidad de la educación a distancia". In: *Tecnología y Comunicación Educativas*. Mexico: ILCE.

TEICHLER, U. (2009). *Sistemas comparados de educación superior en Europa*. Barcelona: Ediciones Octaedro.

TOMAS I FOLCH, M. (coord.) (2006). *Reconstruir la universidad a través del cambio cultural*. Barcelona: Universidad Autónoma de Barcelona.

TÜNNERMANN BERNHEIM, C. (2007). La *universidad necesaria para el siglo XXI*. Managua: Hispamer.

WILLIAMS, R. (2004). *Cultura y cambio tecnológico: el MIT*. Madrid: Alianza Editorial.

About the Authors

Miguel Casas Armengol
marmengol_6@yahoo.es
Founder-Director of the National Open University of Venezuela (UNA)

Lily Stojanovic
Lilystojanovic@yahoo.com
Tenured Lecturer, National Open University of Venezuela (UNA)

Tenured lecturer at the UNA and at the Central University of Venezuela's School of Education. She holds a master's degree in Education from Stanford University, California. She has published numerous works and given conference presentations on assessment, instructional design and ICTs.

She was the general secretary of the UNA from October 1991 to May 1997. Since 2003, she has been a member of the *Programa de Promoción al Investigador* (Investigator Promotion Programme, Level III) She is an advisor to FONACIT (Venezuelan National Fund for Science and Technology) and currently a lecturer on a master's degree course in Distance Education at the UNA.

Av. los Calvanis, 18
Universidad Nacional Abierta, detrás de la comandancia
Sanbernardino
Venezuela

UOC
Universitat Oberta de Catalunya